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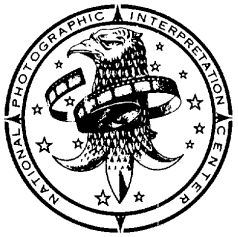
Basic Imagery Interpretation Report



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ZELENOGORSK ROCKET ENGINE TEST FACILITY

25X1A [redacted]

STRATEGIC WEAPONS
INDUSTRIAL FACILITIES

USSR

DECEMBER 1969

25X1A [redacted]

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INSTALLATION OR ACTIVITY NAME	COUNTRY
Zelenogorsk Rocket Engine Test Facility	UR

UTM COORDINATES	GEOGRAPHIC COORDINATES	
NA	60-13-20N 029-43-00E	[redacted]

25X1A

MAP REFERENCE

ACIC. ATC, Series 200, Sheet 0103-25, scale 1:200,000 (SECRET)

25X1D [redacted]

NEGATION DATE (If required)

NA

ABSTRACT

The Zelenogorsk Rocket Engine Test Facility (Static Test Facility) near Leningrad, USSR, appears to be engaged in the research and development of highly toxic propellant formulations. The facility may also be used for development and testing of rocket engines/motors that use highly toxic propellants. The report includes a brief discussion of the environment and development, and a physical description of the facility, augmented by a location map, a photograph of the facility, and a table, keyed to a layout drawing of the facility, indicating the probable function and related data for most buildings and structures. A detailed description of the test building and a discussion of test operations are supplemented by graphics of the structure.

INTRODUCTION

The Zelenogorsk Static Test Facility is situated in relatively flat, heavily wooded terrain 1.5 nautical miles (nm) north of the town of Zelenogorsk, USSR (Figure 1). This facility was constructed sometime between [redacted] and was first observed on KEYHOLE photography in [redacted] The majority of structures, including the test building and associated structures, were completed by [redacted] and the facility probably was operational at least by that time. A detailed construction chronology of the facility is available in a previous NPIC report.[1]

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Possibly related facilities include the Primorsk Rocket Engine Test Facility [redacted] on the Gulf of Finland, approximately 35 nm west-northwest of Zelenogorsk, and several missile-related development, test, and production facilities concentrated in and near the city of Leningrad, about 25 nm south. The proximity of the test facilities at Zelenogorsk and Primorsk, and the fact that they are connected by both road and rail

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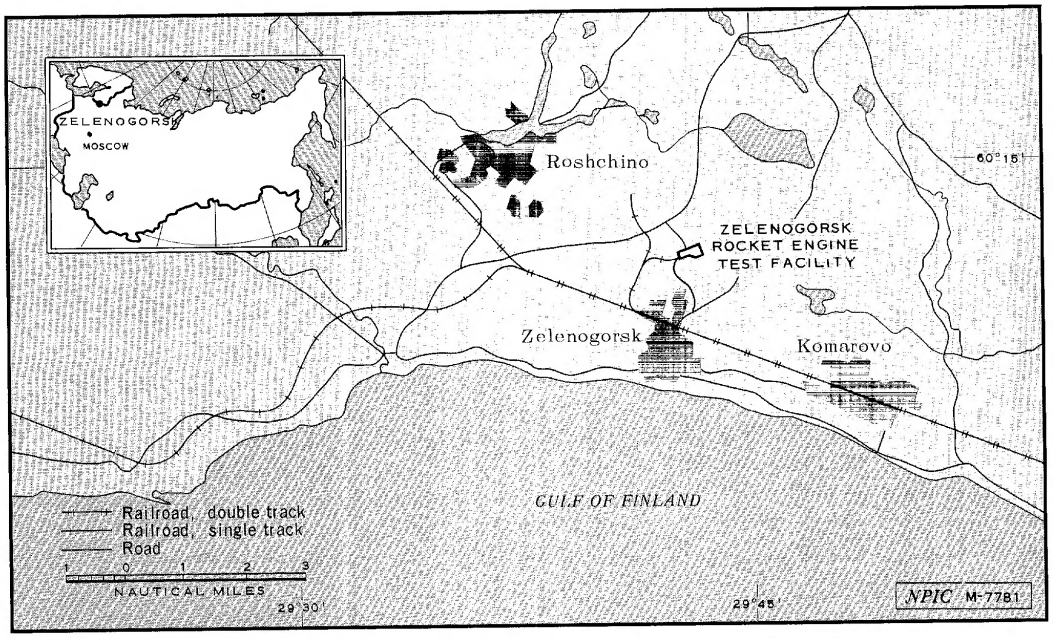

FIGURE 1. LOCATION OF ZELENOGORSK ROCKET ENGINE TEST FACILITY, USSR

suggest a functional interrelationship. Other possibly related facilities in the Leningrad area include:

Guided Missile Production Plant 458
Solid Motor Test Facilities 1, 2, and 3

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[redacted]

Petrokrepost Explosives and Solid Motor Plant Morozov
Toksovo Propellant R & D Facility

[redacted]

BASIC DESCRIPTION

The test facility is relatively small. It includes one large horizontal test building with associated structures and approximately 30 other buildings and structures comprising a total of about 13,000 square meters (140,000 square feet) of floorspace contained in a slightly irregular enclosed area of 15.3 hectares (about 38 acres) (Figure 2). Within this area, buildings and structures housing test and related operations are concentrated at the eastern end of the facility; propellant receiving, handling, preparation, and storage buildings are on the northern side adjacent to the rail spurs that serve the facility; and administration and support services are contained in buildings at the western end of the facility. A large open area in the center of the facility is available for future expansion. A network of overhead utility pipelines serves most of the buildings in the facility.

The probable function and related data on most buildings and structures are presented in a table keyed to a detailed line drawing of the facility (Figure 3). The horizontal test building (item 20) is discussed in detail as the key structure at the facility.

Horizontal Test Building

The basic building plan for this structure is similar to test buildings at each of three other test facilities in the USSR*. It contains four horizontal test positions (items 20c, d, j, and k, test positions 1-4, respectively), an instrumentation section (item 20i), and a large probable preparation and checkout section (item 20a). Test position 3 (item 20j) appears to be a typical sea level horizontal test position and has a small, slightly depressed, probable concrete pad extending from it. However, the structures associated with test positions 1, 2, and 4 (items 20c, d, and k) are unique to the test building at Zelenogorsk, and are identified as probable exhaust containment and treatment units. For descriptive purposes these units are referred to as Unit A and Unit B (Figure 3). Unit A consists of two long containment

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vessels (items 20e and f), each with a diameter of [redacted] connected to test positions 1 and 2, respectively. These vessels are interconnected by a pipe or conduit at a point between the two probable air heaters (item 20g) that are probably connected to the vessels by conduits extending from the heaters. A probable treatment tank (item 20h) supported on a raised platform is connected to the outer end of each containment vessel by a pipe or conduit.

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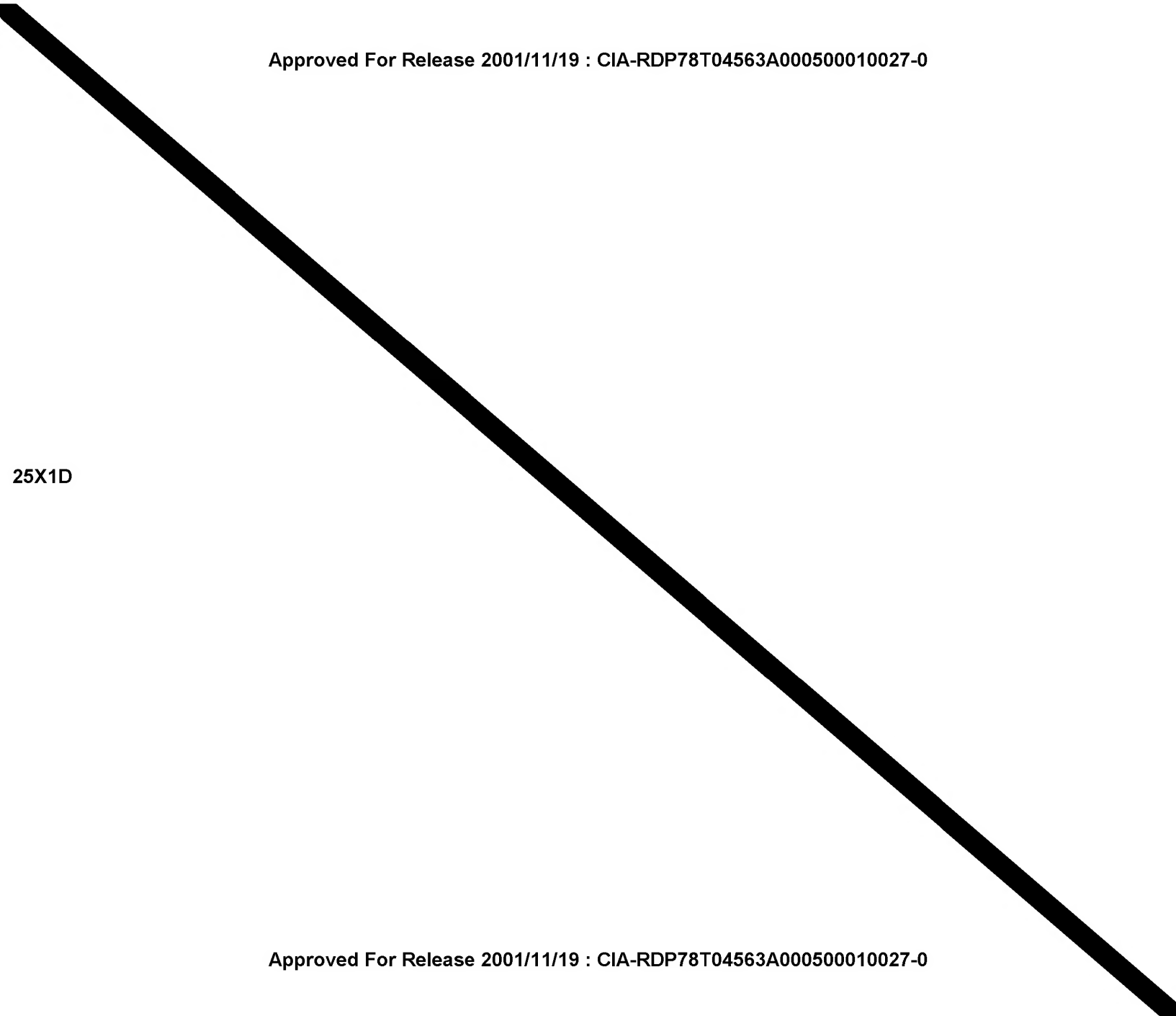
[redacted]

The precise function of these containment and treatment units related to hot-fire test activity is difficult to determine from imagery of the facility. However, based on the identification of the components that comprise each containment and treatment unit and the size of the respective containment vessels, the immediate post-fire exhaust gas flow sequence can be postulated. Immediately after a firing, the exhaust gases would be trapped or collected in the containment vessel(s). Heated air from the heaters would be injected into the vessels to drive the exhaust gases out of the vessel(s) and into the treatment tank via the connecting conduits. In the treatment tank, exhaust products may be filtered and/or chemically treated and then allowed to escape into the atmosphere through the orifice on the top of the tank.

* At Faustovo, Nizhnyaya Salda, and Ufa



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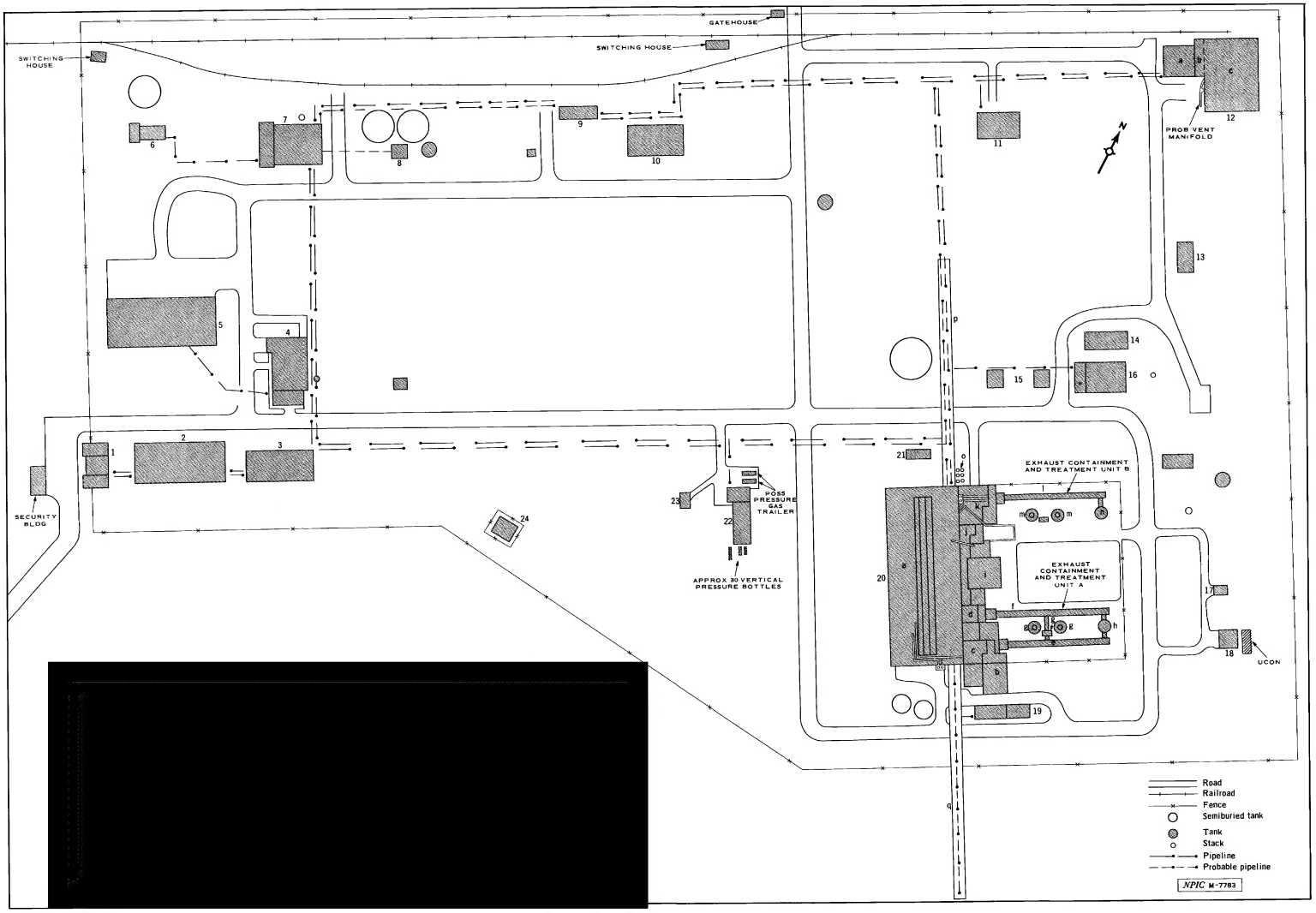

FIGURE 3. ZELENOGORSK STATIC TEST FACILITY

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Items in this table are keyed to Figure 3

Item	Probable Function	Comments
1	Admin bldg	Bldg contains two floors. Dimensions are overall.
2	Admin/housing bldg	Bldg contains three floors.
3	Admin/housing bldg	Bldg contains two floors and a basement.
4	Research/lab bldg	Dimensions are overall.
5	Veh maint/storage bldg	--
6	Pumphouse	Serves one large semiburied storage tank.
7	Steamplant	Dimensions are overall.
8	Pumphouse	Serves one above-ground and two semiburied storage tanks.
9	Propellant rcv/handling bldg	--
10	Propellant storage/handling bldg	--
11	Poss propellant stor bldg	---
12	Propellant rcv, handling, preparation, and storage bldg	---
a		---
b		---
c		---
13	Utility shop	---
14	Lab annex	---
15	Poss storage vaults (2)	Dimensions are for each structure.
16	Laboratory bldg	---
17	Poss sm rkt mtr stor bldg	Bldg is heavily barricaded.
18	Storage bldg	---
19	Test structures maint bldg	Bldg has high-bay section [redacted] 25X1D
20	Horizontal test bldg	Floorspace total includes [redacted] of untabulated space. 25X1D
a	Preparation & checkout section	---
b	Test support annex	---
25X1D c	Test position 1	Dimensions are overall.
d	Test position 2	---
e	Containment vessel	Volume is estimated at [redacted] 25X1D
f	Containment vessel	Volume is estimated at [redacted] 25X1D
g	Air heaters (2)	Dimensions are for each structure. Height includes stack. 25X1D
h	Treatment tank	Height includes support stand
i	Instrumentation section	---
j	Test position 3	---
k	Test position 4	---
l	Containment vessel	Volume is estimate at [redacted] 25X1D
m	Air heaters (2)	[redacted] 25X1D Dimensions are for each structure. Height includes stack.
n	Treatment tank	Height includes support stand.
o	Inert gas storage	Consists of six vertical pressure bottles.
p	Roof structure	Apparently houses overhead pipelines that enter the bldg.
q	Roof structure	May house air exhaust ducts/conduits.
21	Test support bldg	---
22	Poss gas pressurization and storage bldg	Dimensions are overall. Inert storage and two possible pressure gas (mobile) trailers are associated with the bldg.
23	Support bldg	Bldg prob is associated with item 22.
24	Storage bldg	Bldg is separately secured by a fence.
		Total includes [redacted] 25X1D contained in six unnumbered bldgs.

The volume of the containment vessels connected to the test positions effectively limits the amount of propellant that can be expended during any hot-fire test. The exhaust gases from tests conducted at test positions 1 or 2 probably can be vented simultaneously to both of the containment vessels of Unit A. The collective volume of these vessels is estimated at 531 cubic meters (18,765 cubic feet). The volume of the Unit B containment vessel is estimated at 254 cubic meters (8,970 cubic feet).

Another unusual feature of the test building is the presence of two roof structures (items 20p and q) supported by posts at regular intervals. These structures each extend
25X1D [redacted] out from opposite ends of the building. The structure that extends from the northern end of the building (item 20p) appears to cover several overhead pipelines that apparently enter the test building where it abuts the structure. The roof structure (item 20q) attached to the southern end of the buildings may house overhead pipes or conduits (which may function as air exhaust ducts) and extends considerably beyond the facility boundary and dead ends in heavily wooded terrain.

The test building appears to be well ventilated. Numerous small vent stacks are visible on the roof of the building and are arranged in a row along the line separating the bays and shops associated with the test positions and the preparation and checkout section. Two sets of larger, higher stacks with associated pipes or conduits visible are evident at the southern end of the building and at test position 4 on the northern side of the building. In addition, the preparation and checkout section has a long roof ventilator with sloping sides which is more efficient than the vertical-sided monitors observed at similar Soviet horizontal test buildings.

The physical components identified at the well ventilated horizontal test building suggest that test programs at Zelenogorsk are for research and development of highly toxic propellant formulations, or the testing of rocket engines/motors in which highly toxic propellants are used--or a combination of both types of activity. Testing of propulsion hardware and components could be accomplished under simulated high-altitude conditions.

25X1D The present configuration of the test building has not been changed since [redacted] when the probable containment and treatment units were noted under construction. These
25X1D units may have been put into operation as early as [redacted] To date, however, no firm evidence of test activity and no rocket propulsion hardware have been observed at the
25X1D facility.
25X1D [redacted]

Essential Services

The facility is rail and road served. Two single-track rail spurs serve the facility exclusively and connect to another spur which extends to Zelenogorsk. Rail access to Leningrad and Primorsk is provided by connections on the main line from Leningrad to Vyborg and other points northwest to the Finnish frontier. Hard-surfaced, all-weather roads also provide access to Leningrad and other points in the immediate area. The nearest
25X1A air service is available at the Leningrad/Levashevo Airfield [redacted] approximately 15 nm southeast. Electric power probably is supplied from Leningrad, heat is generated from within the facility (item 7), and water is available in quantity from the surrounding area.

Security

The facility is in a remote area and is enclosed by a wall approximately 3 meters (10 feet) high. Road access is provided at an entrance adjacent to the administration building (item 1) and at an entrance on the northern side of the facility. Other entrances have checkpoints.

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